Claims

What is claimed is:

1. A method of detecting contamination of engine fluid in an engine, comprising:

providing engine fluid to a particle counter; and

measuring a characteristic of cleanliness of the engine fluid with the particle counter during operation of the engine.

2. The method of claim 1, further including displaying the characteristic of cleanliness to an operator.

3. The method of claim 1, further including operating the engine in a dynamometer test during the stage of measuring the characteristic of cleanliness of the engine fluid.

4. The method of claim 3, further including halting the dynamometer test based on the characteristic of cleanliness of the engine fluid.

5. The method of claim 1, wherein the characteristic of cleanliness is selected from one of a particle count, a particle size, or a rate of particle accumulation.

6. The method of claim 1, wherein the engine fluid is unfiltered.

7. The method of claim 1, further including placing a filtration system on the engine.

8. The method of claim 7, further including operating the engine in a dynamometer test during the stage of measuring the characteristic of cleanliness of the engine fluid.

9. The method of claim 7, further including operating the filtration system to clean the engine fluid.

10. The method of claim 9, wherein the operation of the filtration system is triggered by the characteristic of the cleanliness exceeding a threshold value.

11. The method of claim 1, further comprising making recommendations to an engine builder based on an analysis of the characteristic of the cleanliness of the engine fluid.

12. A system for measuring contamination in engine fluid of an engine, comprising:

a source of engine fluid;

a particle counter attached to the source of engine fluid from the engine; and

a drain for draining the engine fluid from the particle counter.

13. The system of claim 12, further including a filtration system in fluid communication with the engine for filtering and returning engine fluid from the engine.

14. The system of claim 13, wherein the filtration system is a kidney loop filtration system.

15. The system of claim 13, wherein the filtration system further includes:

an external pump for drawing the engine fluid from the engine; and

an external filter through which the pump draws the engine fluid.

16. The system of claim 12 wherein the particle counter is an optical type particle counter.

17. The system of claim 12, further including a computer for displaying particle count information, said computer being in communication with the particle counter.

18. A filtration system for cleaning engine fluid during an engine dynamometer test, comprising:

an external pump for drawing the engine fluid from the engine; and

an external filter through which the pump draws the engine fluid.

19. The filtration system of claim 18, wherein the external filter is placed upstream of the external pump.

20. The filtration system of claim 19, further including a second external filter placed downstream of the external pump.

21. A system for detecting contaminants in engine fluid from a running engine and cleaning the contaminants, comprising:

a filtration system for cleaning the engine fluid; and

a particle counter attached to a source of unfiltered engine fluid.

22. A method of detecting contamination in engine fluid and cleaning engine fluid in a running engine, comprising:

measuring characteristics of the cleanliness of the engine fluid during a test cycle;

operating a filtration system for a first period of time in the test cycle; and

taking corrective action during a second period of time in the test cycle when the characteristics of the cleanliness of the engine fluid reaches a threshold level.

23. The method of claim 22, wherein taking corrective action includes halting the running of the engine.

24. The method of claim 22, wherein taking corrective action includes operating the filtration system for the second period of time in the test cycle.

25. The method of claim 22, wherein the characteristic of cleanliness is selected from one of a particle count, a particle size, or a rate of particle accumulation.

26. A system for detecting contaminants in engine fluid from a running engine and cleaning the contaminants, comprising:

a filtration system for cleaning the engine fluid, the filtration system having:

an external pump for drawing the engine fluid from the engine; and

an external filter through which the pump draws the engine fluid; and

a particle counter system attached to a source of unfiltered engine fluid, the particle counter system including an optical particle counter and a computer for displaying particle count information, said computer being in communication with the particle counter.

27. A method of analyzing the health of an engine, comprising:

providing engine fluid to a particle counter; and

measuring a characteristic of the cleanliness of the engine fluid with the particle counter during operation of the engine.

28. The method of claim 27, wherein the characteristic of the cleanliness of the engine fluid is selected from one of a particle count, a particle size, or a rate of particle accumulation.

29. The method of claim 27, wherein providing engine fluid to a particle counter and measuring the characteristic of cleanliness occurs during a first time period.

30. The method of claim 29, further comprising analyzing the health of the engine based on the characteristic of cleanliness during the first time period.

31. The method of claim 30, further comprising filtering the engine fluid if a characteristic of cleanliness exceeds a threshold value during the first period.

32. The method of claim 30, further comprising making recommendations to a builder of the engine based on the health of the engine during the first period.

33. The method of claim 29, further comprising:

providing engine fluid to a particle counter during a second time period; and

measuring the characteristic of the cleanliness of the engine fluid with the particle counter during operation of the engine during a second time period.

34. The method of claim 33, further comprising filtering the engine fluid during the second time period.

35. The method of claim 34, wherein a duration of the second time period is based on a preset time value.

36. The method of claim 34, wherein a duration of the second time period is based on the characteristic of the cleanliness of the engine.

37. The method of claim 34, further comprising analyzing the health of the engine based on the characteristic of cleanliness during the second time period.

38. The method of claim 37, further comprising providing an indication of a malfunctioning engine if the characteristic of cleanliness is a particle count and if the particle count rises above a threshold value over a period of time.

39. The method of claim 37, further comprising halting the engine if the health of the engine indicates a malfunction.

40. The method of claim 27, further comprising analyzing the health of the engine in response to the characteristic of the cleanliness of the engine.